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Monitoring national land cover and land use change due to natural and anthropogenic disturbances

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Land cover, land use, and change

- Land cover and land use provide both direct economic value from food, fuel, and fiber and indirect services to human society
- Land cover experiences the regular natural and/or anthropogenic disturbances
- Land system resilience allows natural and built systems to maintain their basic characters and functions in the face of disturbance
- Changes in climate and land use affect the resilience of ecosystems and the ability to sustain physical, biological, biogeochemical, and ecological process

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Monitor national land cover/use change (NCA 4&5)

- USGS National land cover database (NLCD)
- USGS Land Change Monitoring, Assessment, and Projection (LCMAP)

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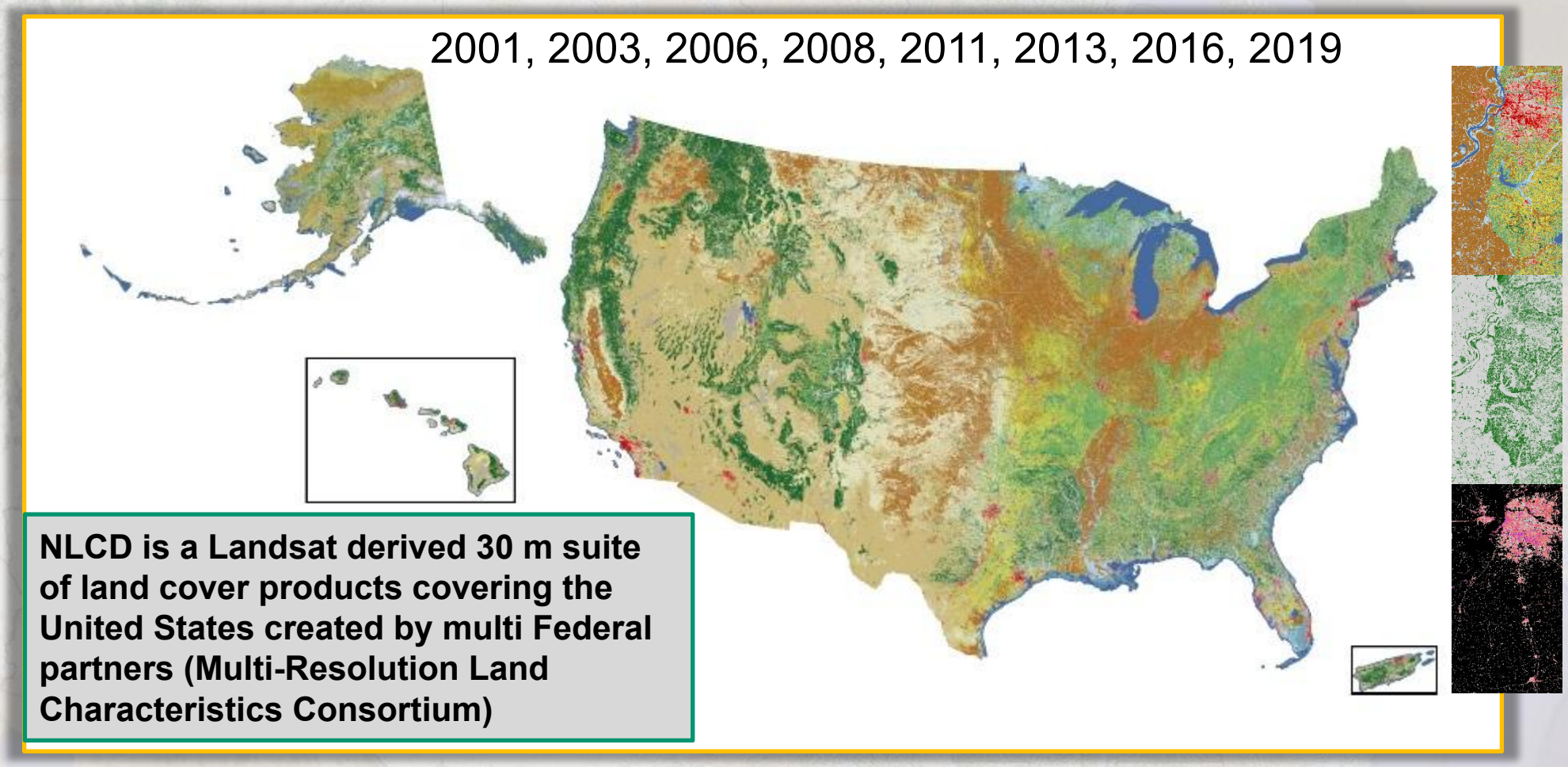
NLCD land Cover has been used for NCA4



NLCD is a Landsat derived 30 m suite of land cover products covering the United States created by multi Federal partners (Multi-Resolution Land Characteristics Consortium)

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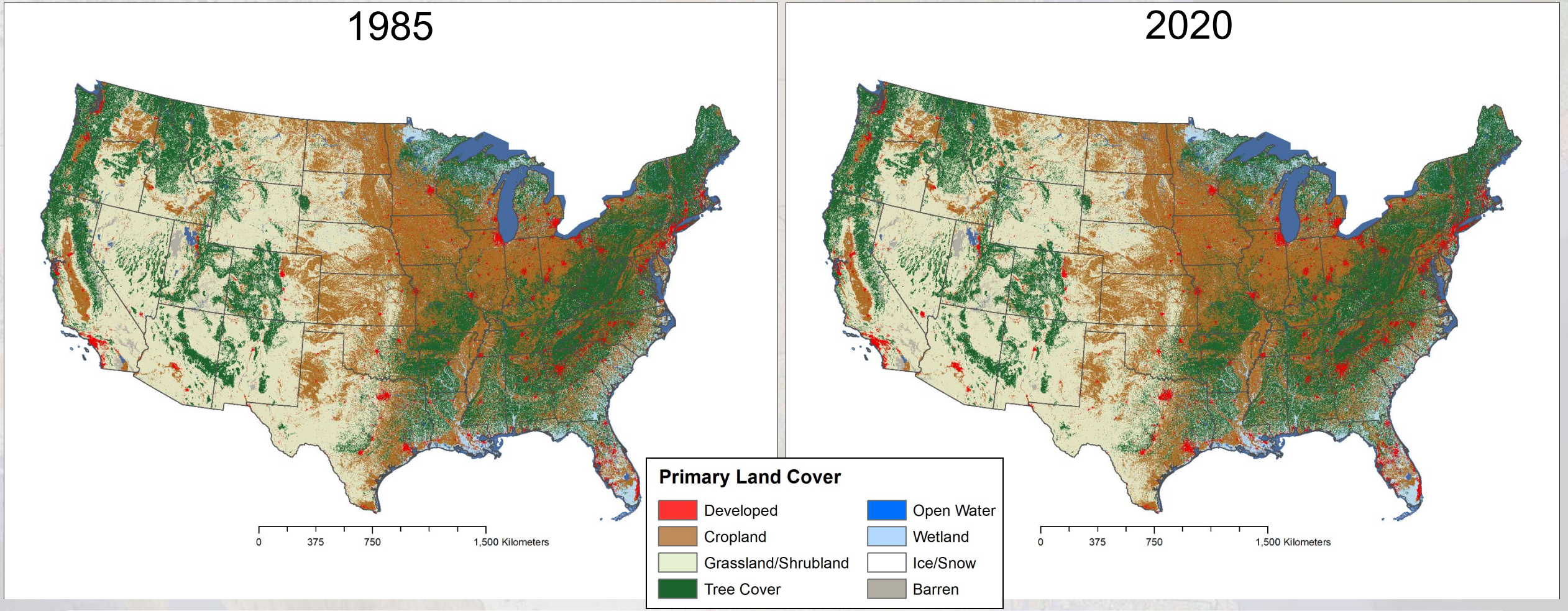
LCMAP Primary Land Cover – NCA5



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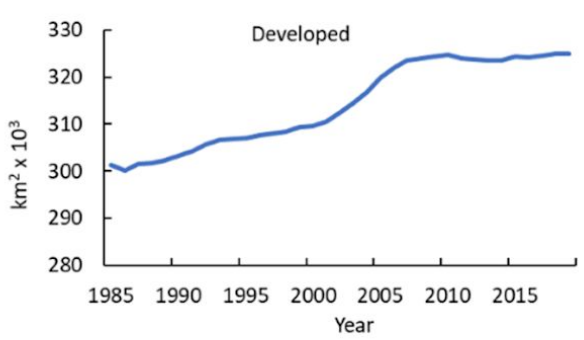
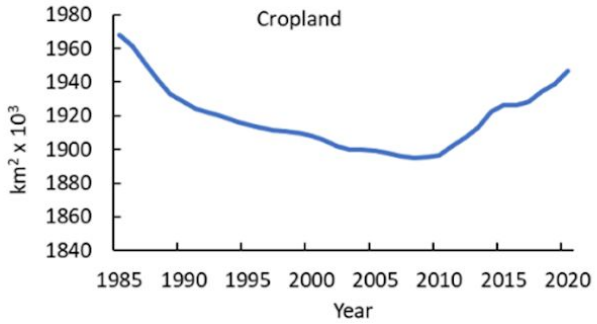
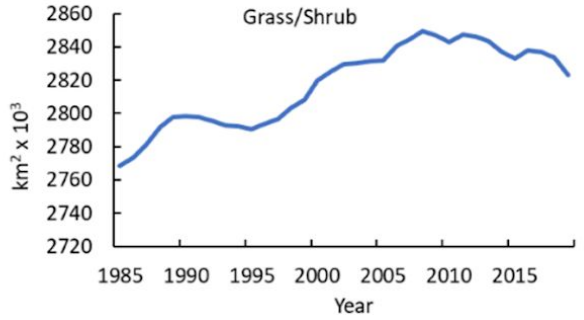
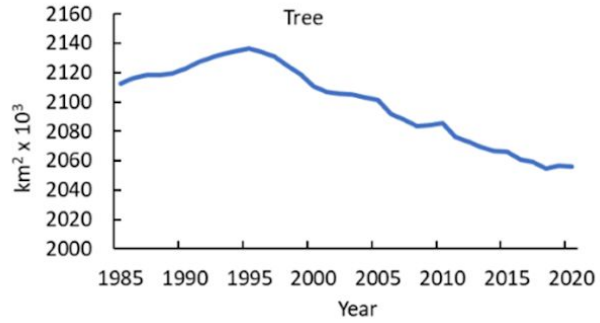
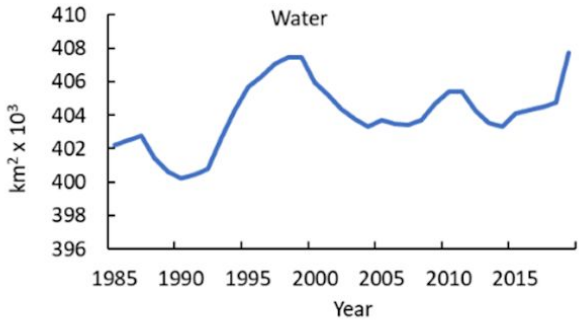
Land cover change (1985-2020)

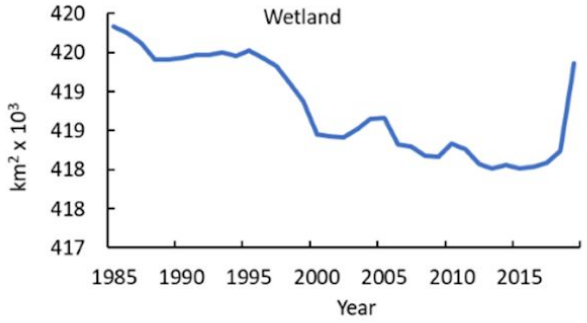


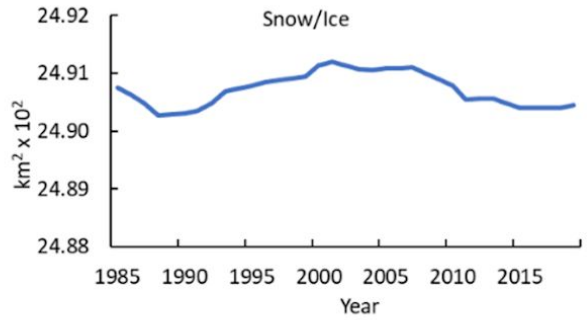


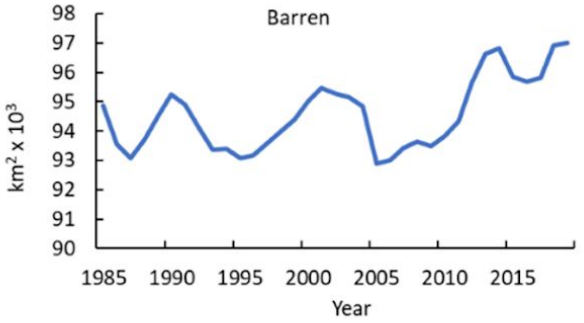












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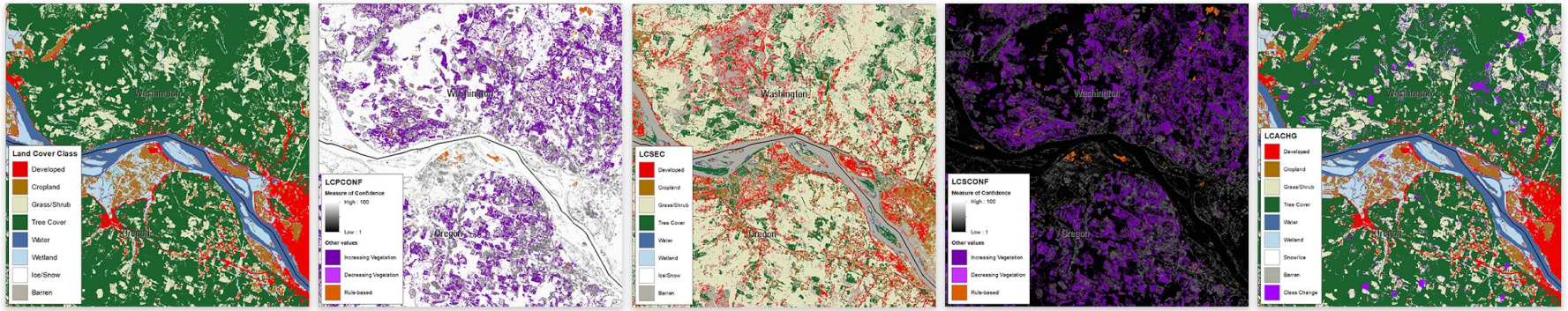
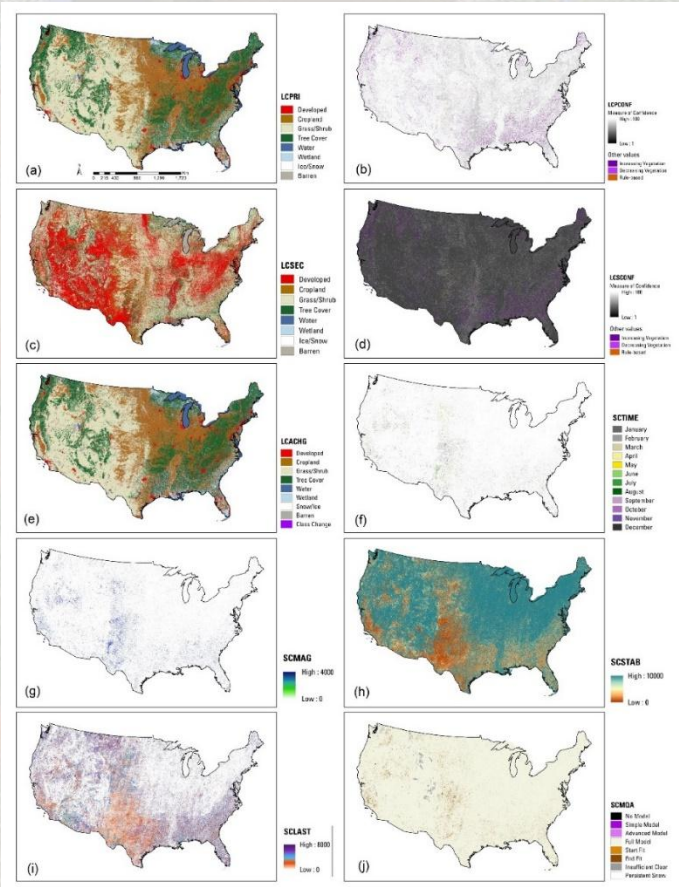
LCMAP annual land surface change and land cover





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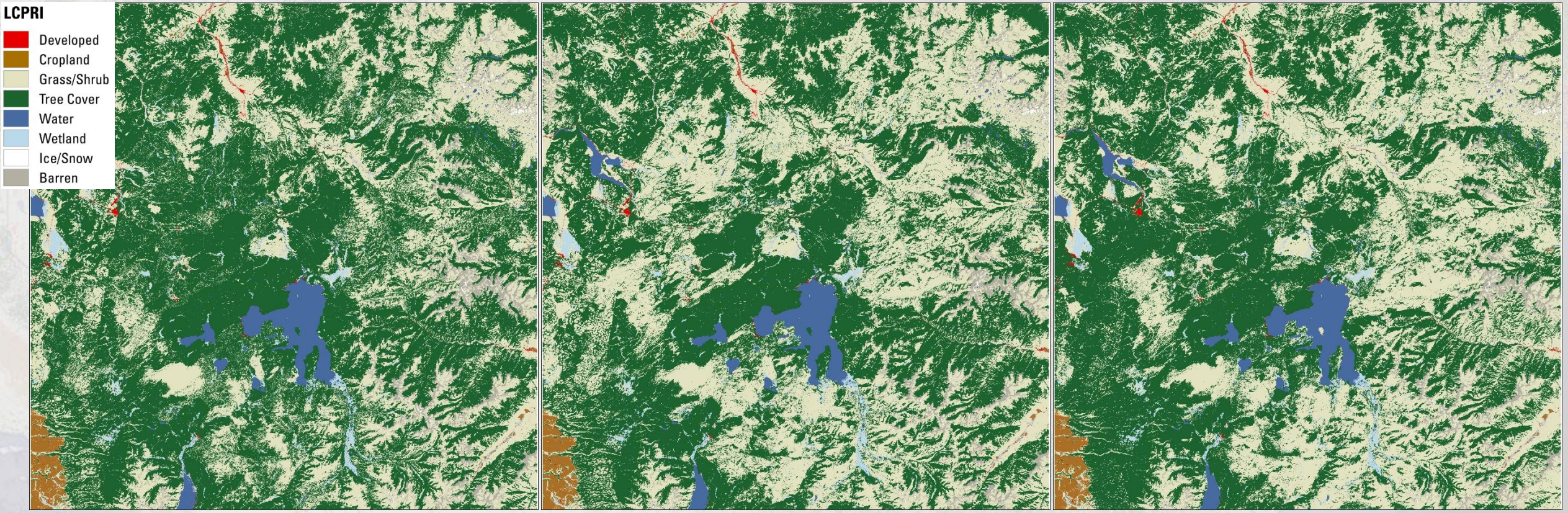
Primary land cover change in Yellow Stone



1985 1990 2016

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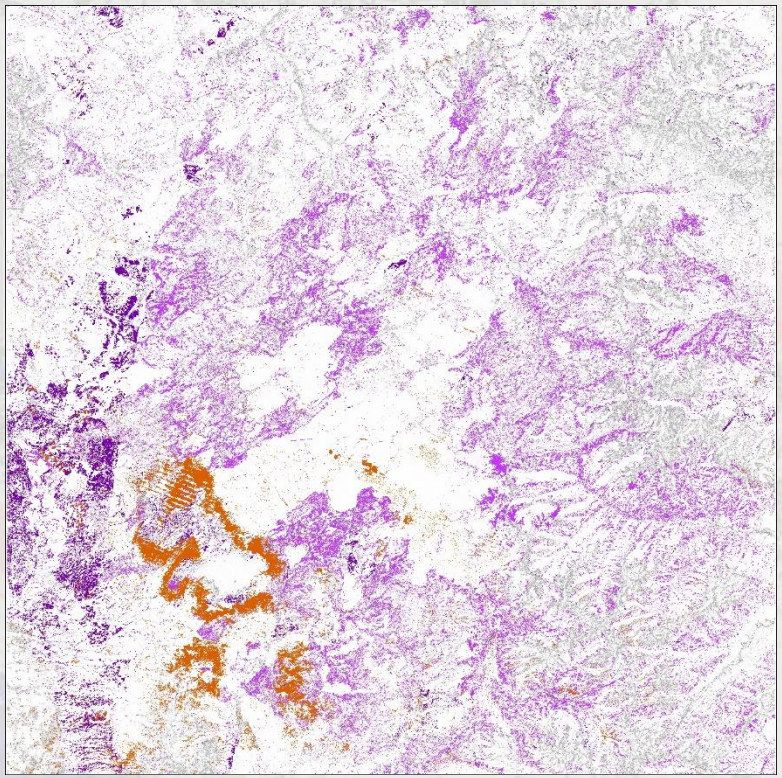
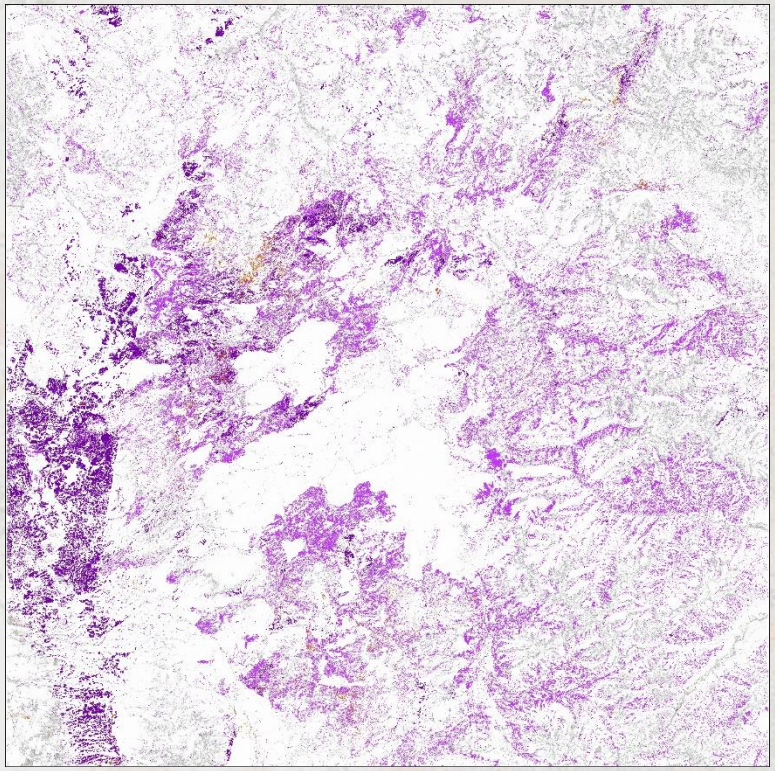
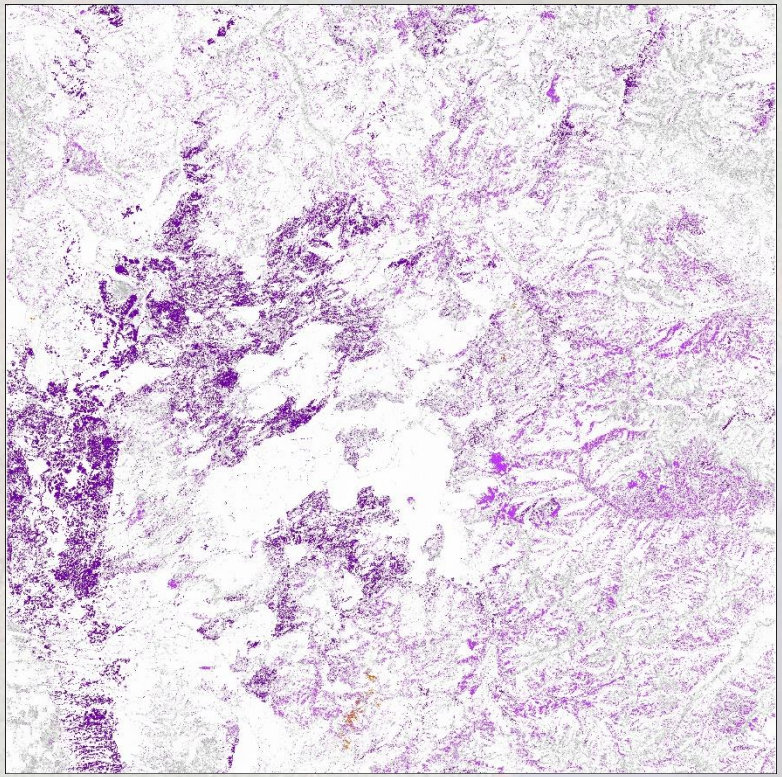
Primary land cover confidence



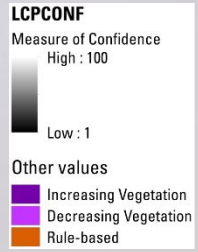
1985



1990



2016



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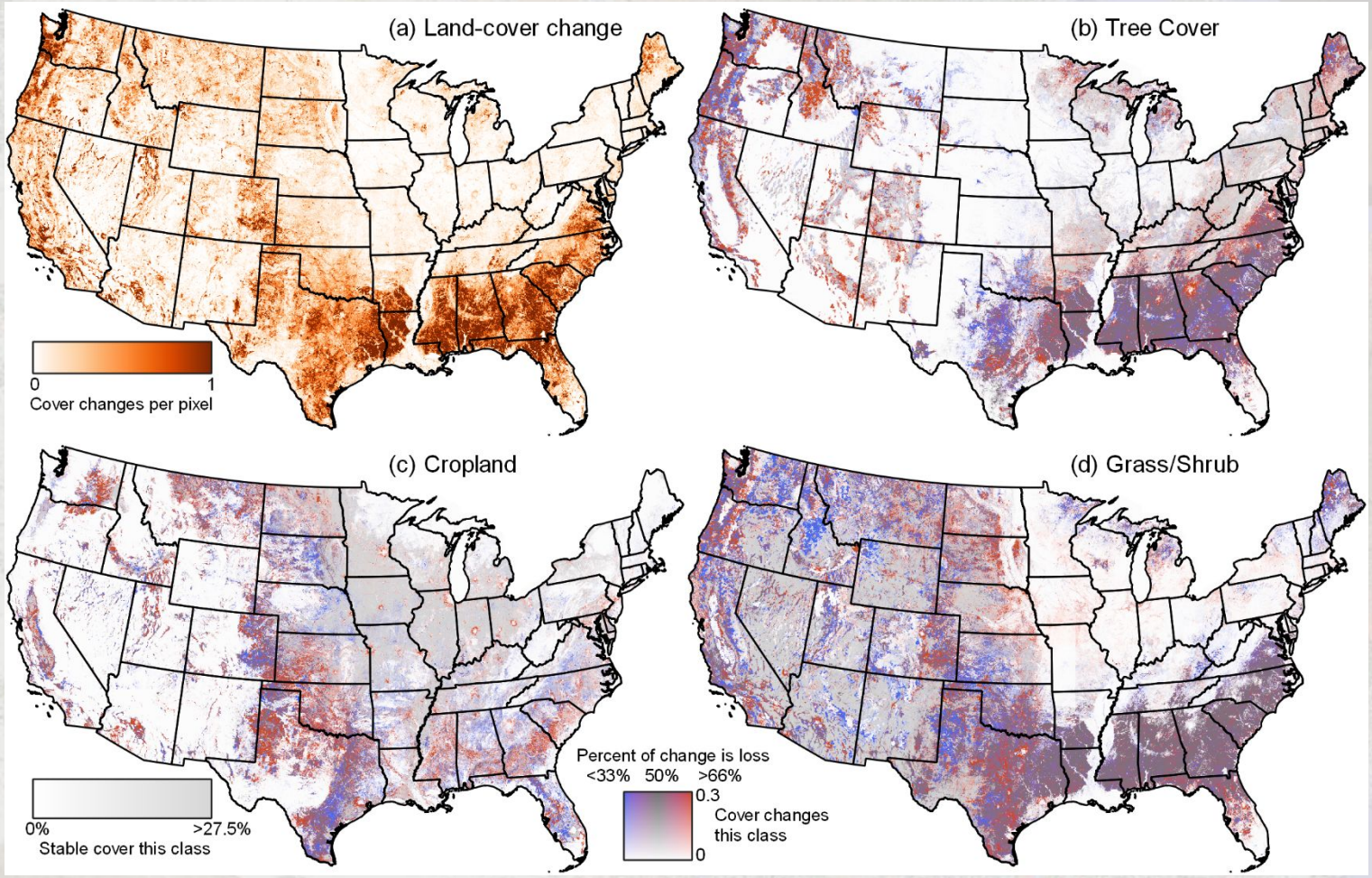
Land-cover conversion from 1985 to 2016



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Potential new indicators

- Tree regrowth time

- Urban heat island intensity

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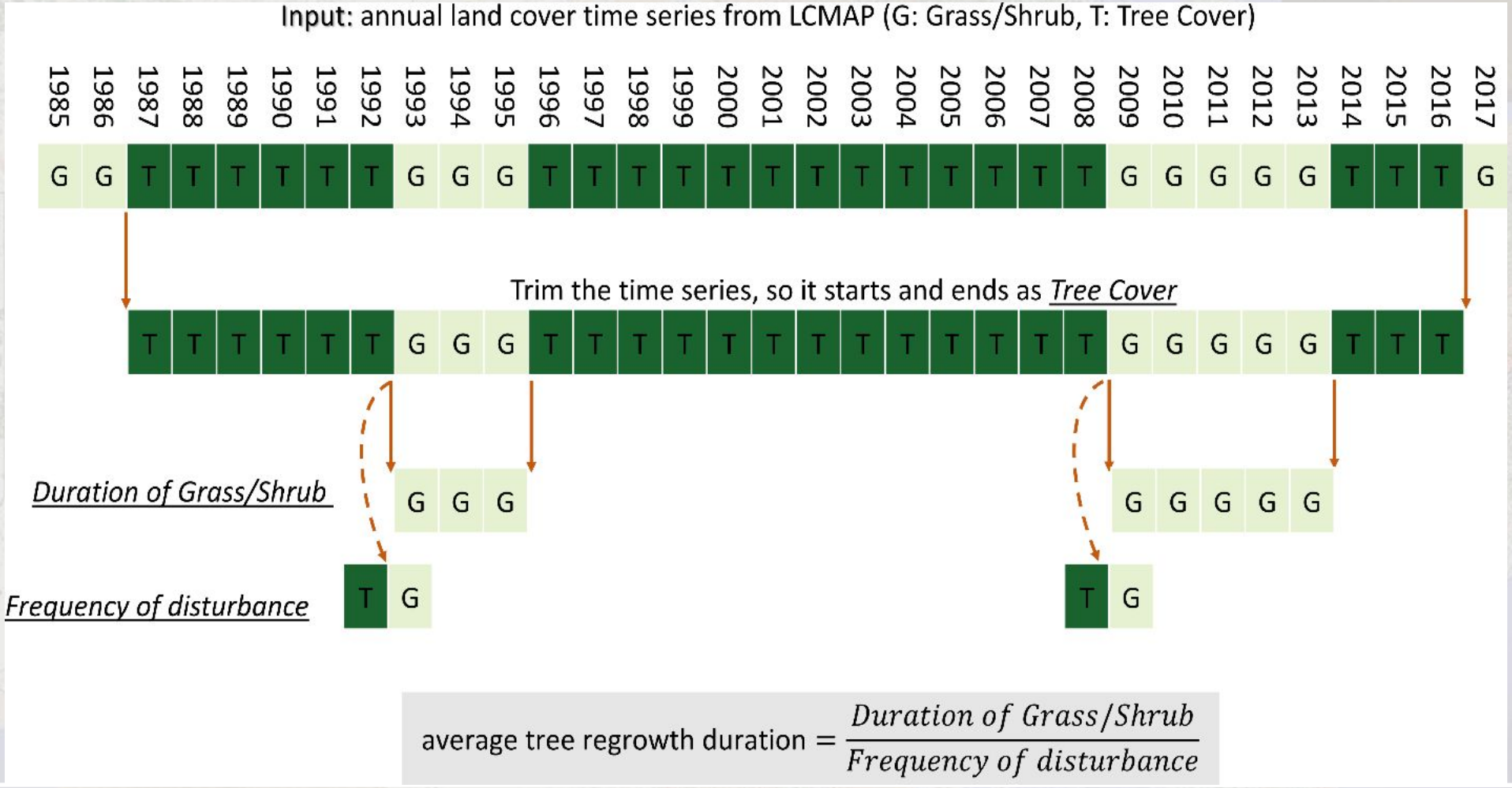
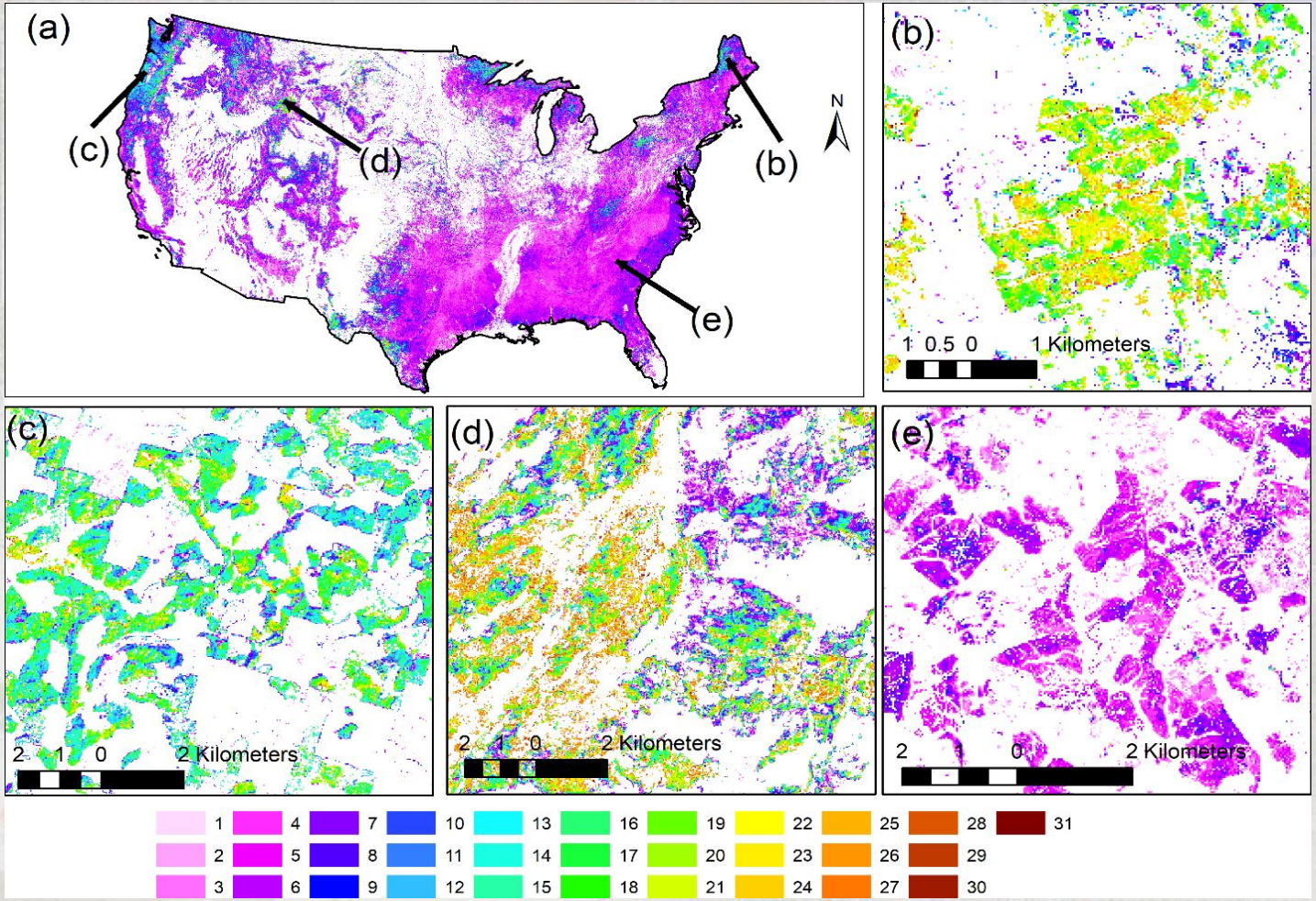
Tree regrowth duration estimate from LCMAP



Average tree regrowth duration in years



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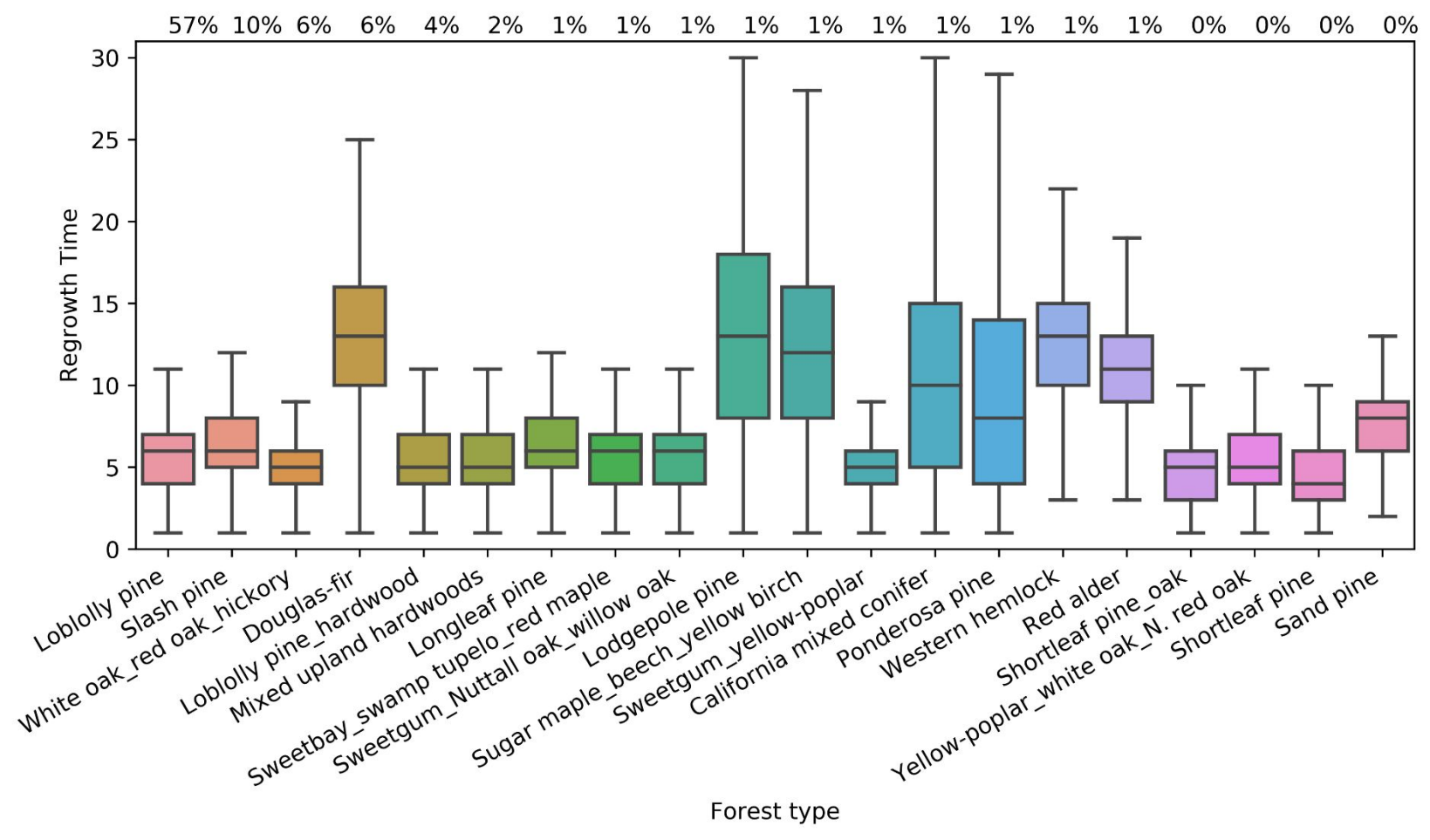
Tree regrowth time (year) of different tree types



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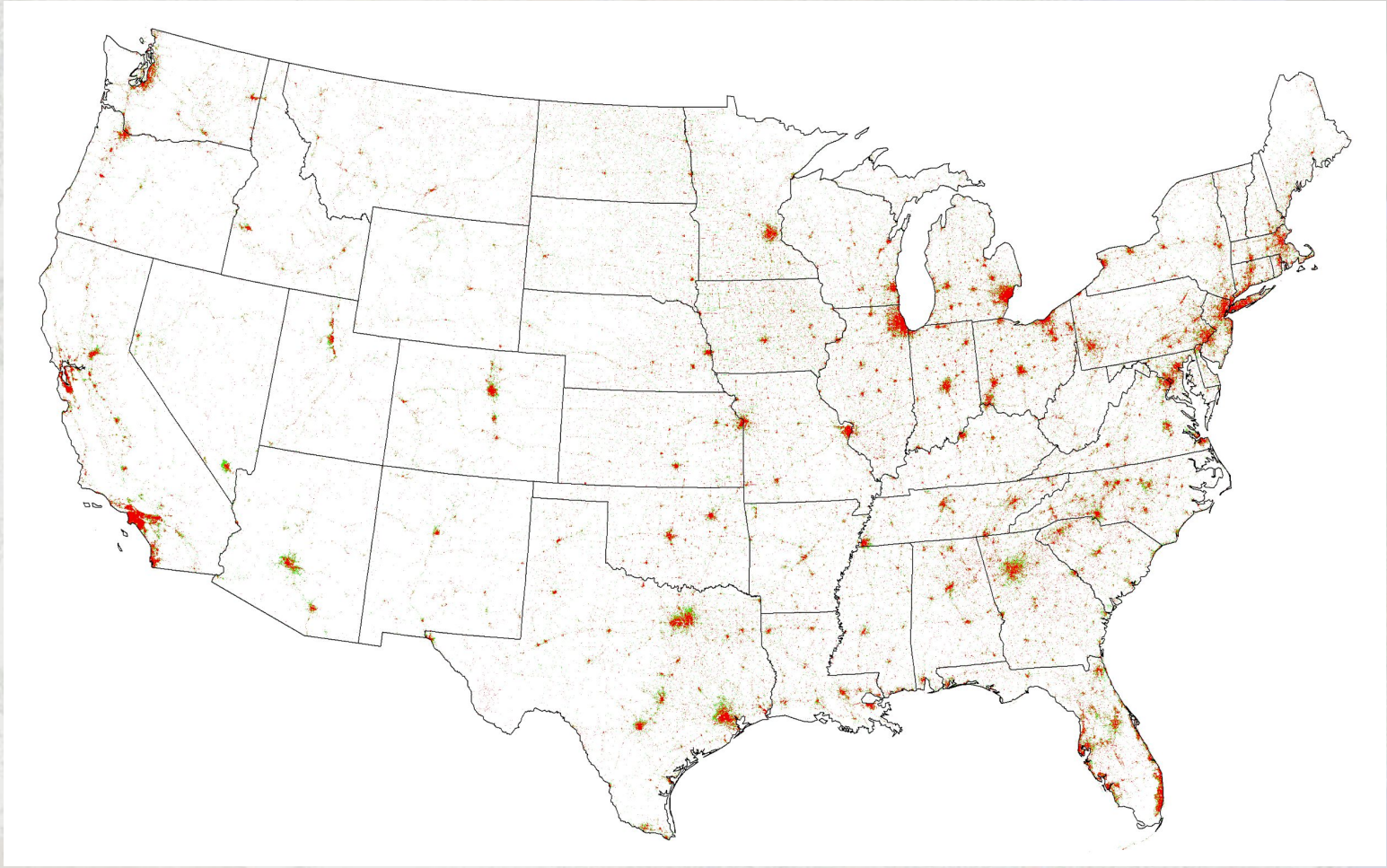
Urban land increased about 7.95% from 1985 to 2019



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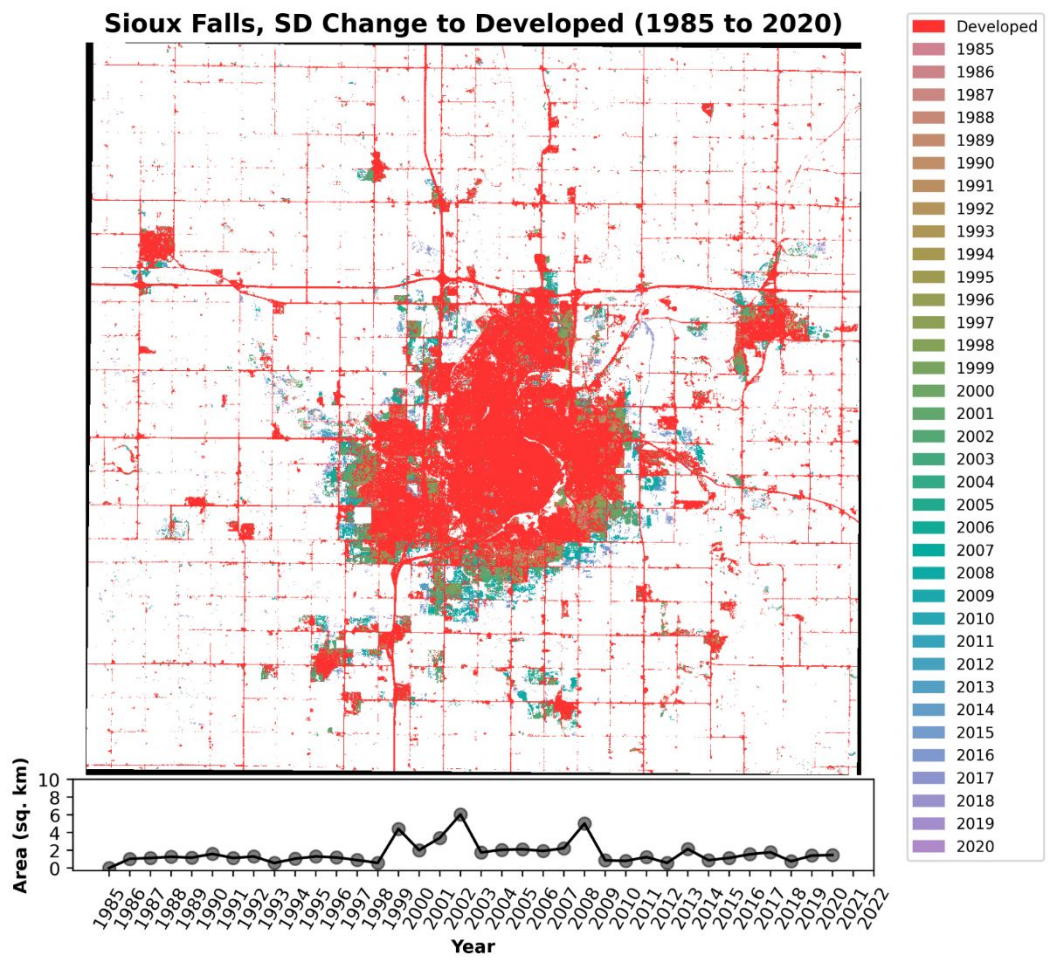
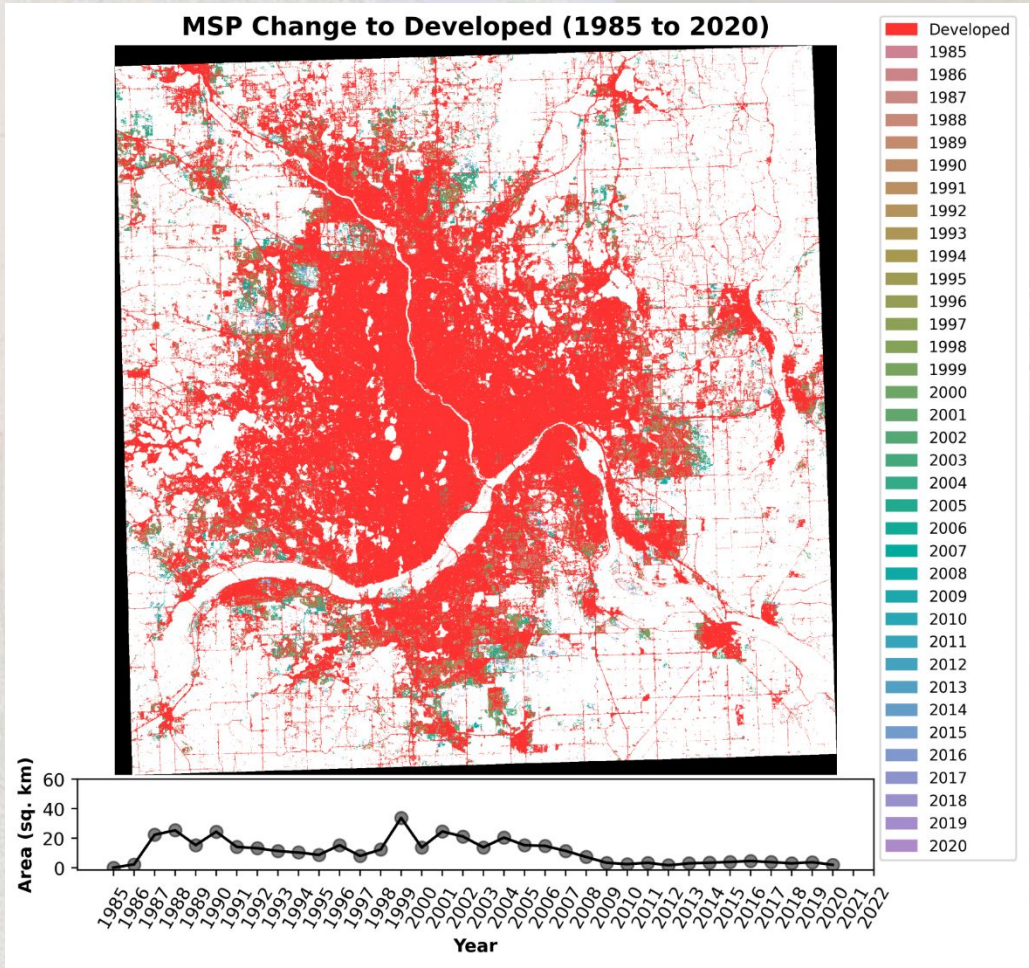
Urban development (1985-2020)





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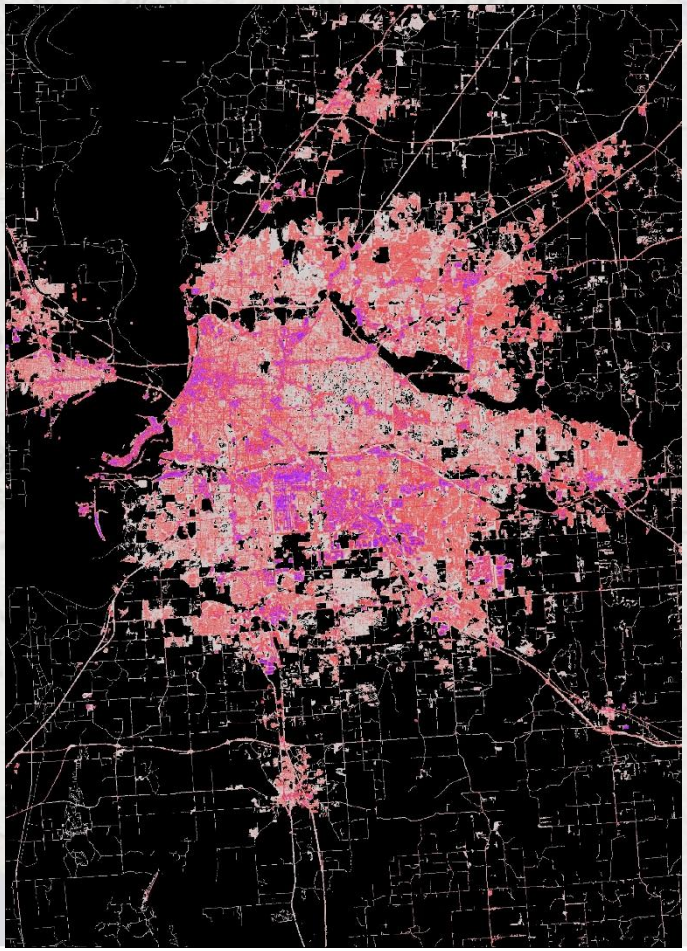
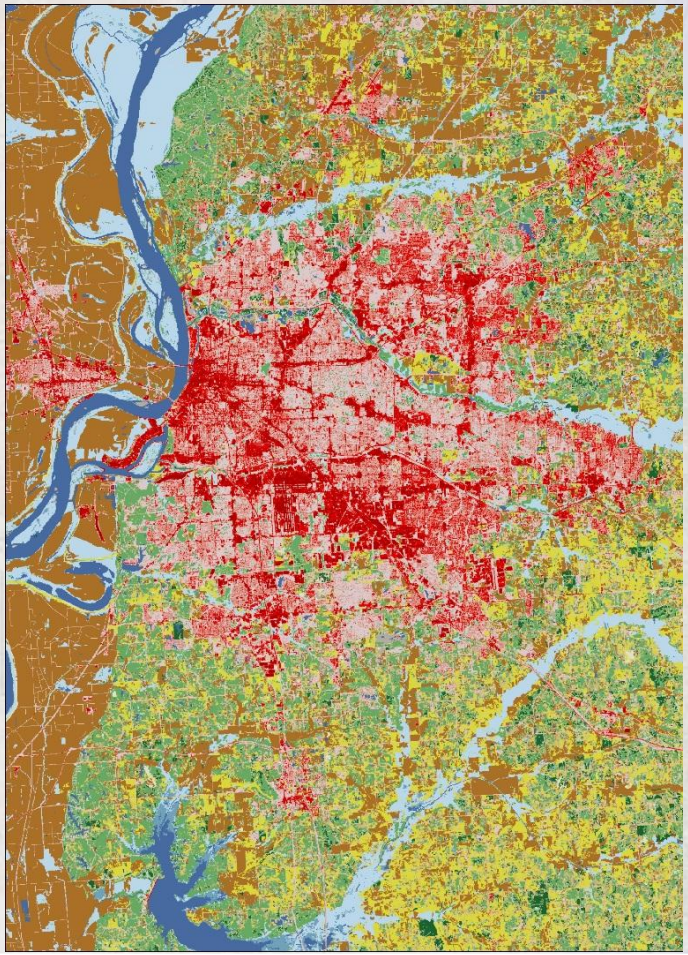
Impervious surface and urban land cover





1-19% - 21
20-49% - 22
50-79% - 23
80-100% - 24

21 Developed, Open Space
22 Developed, Low Intensity
23 Developed, Medium Intensity
24 Developed, High Intensity

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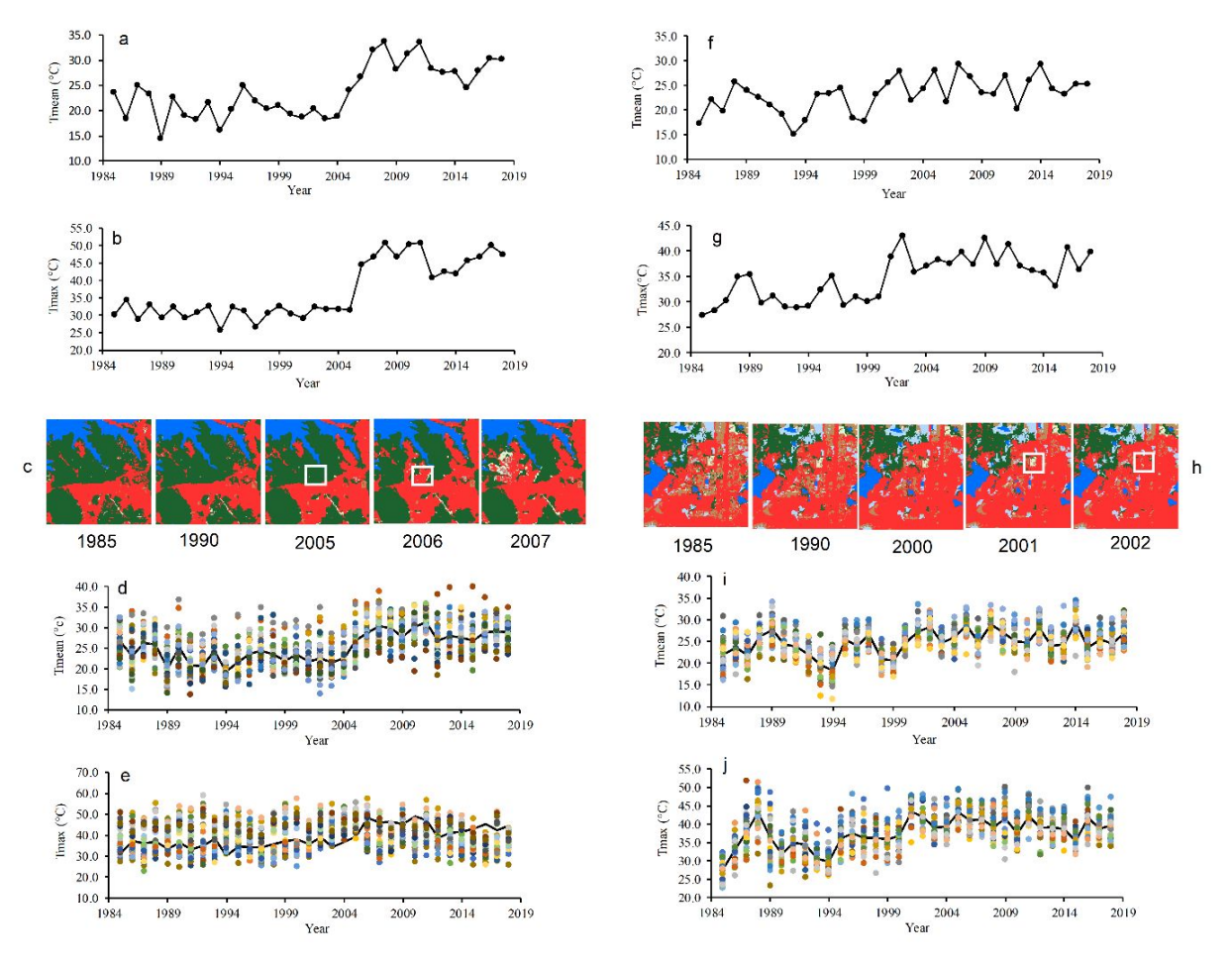
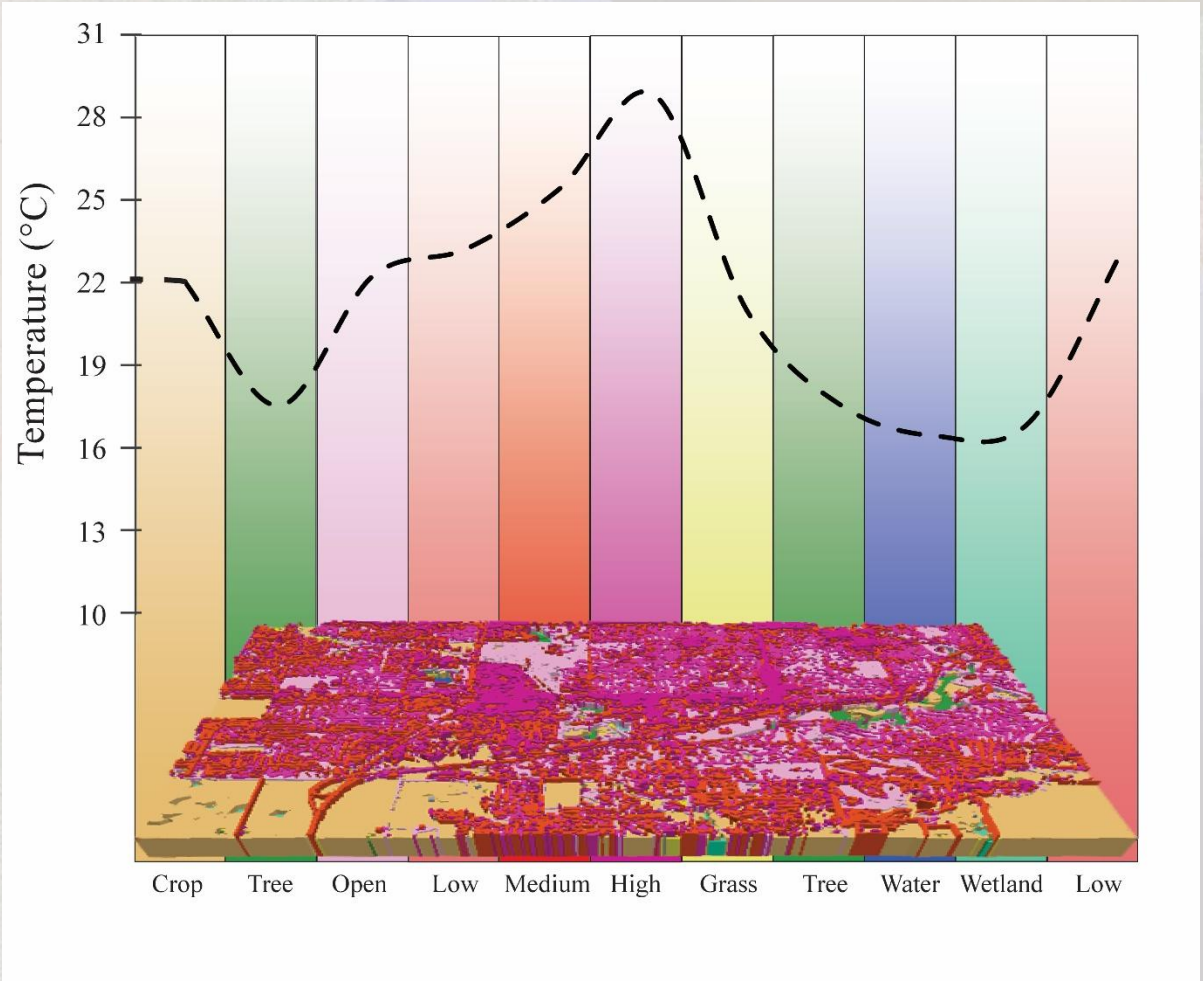
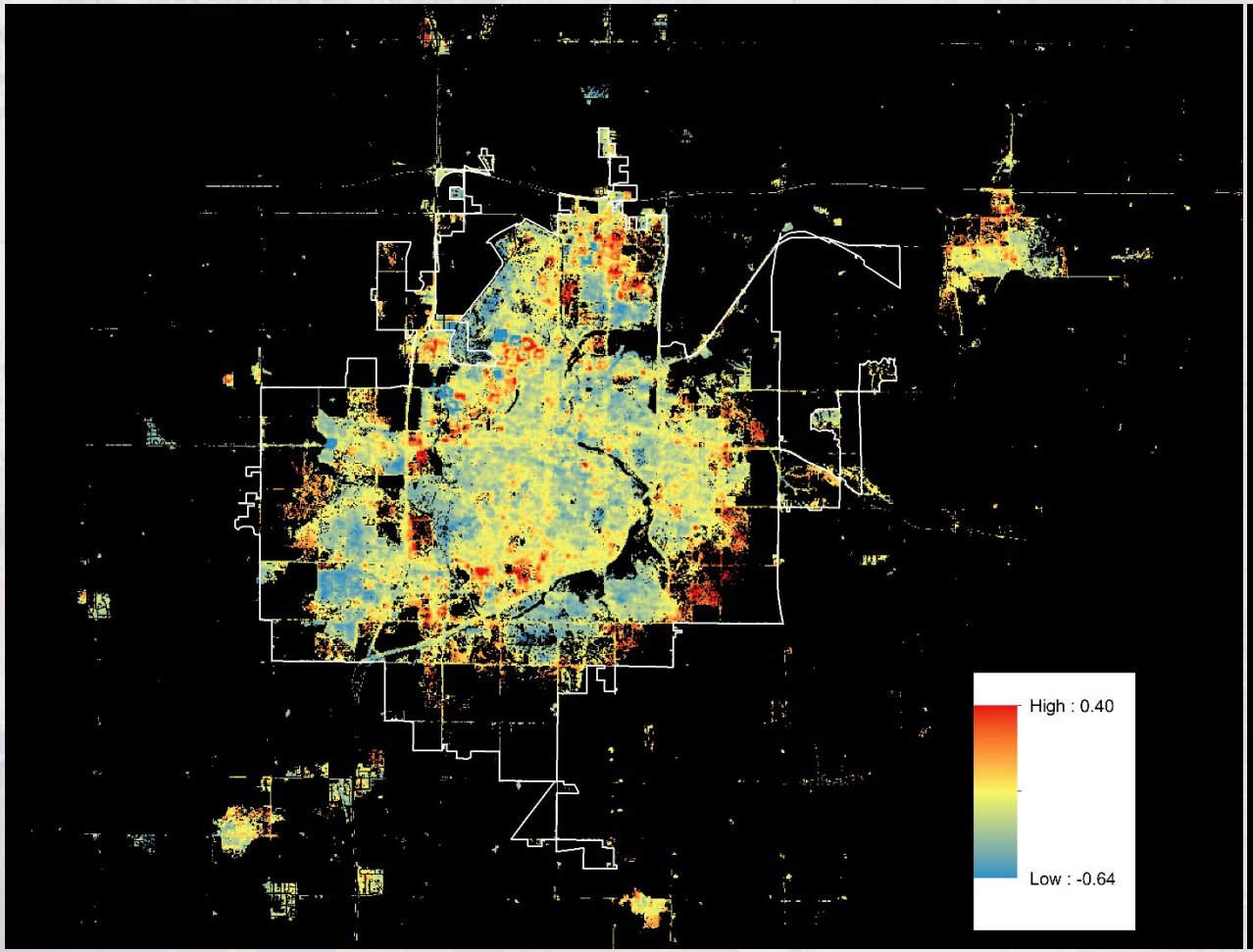
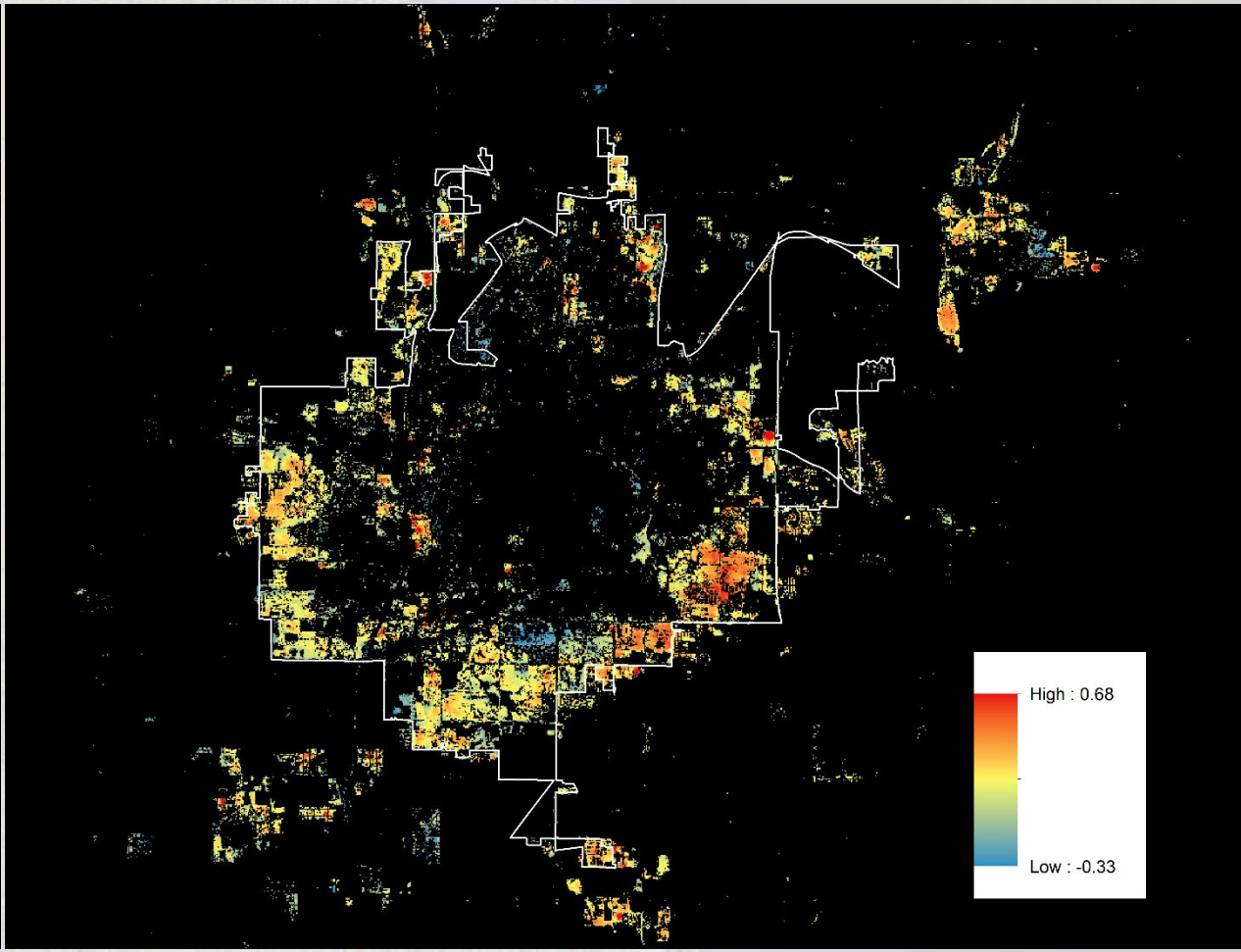
LST change and LST on different land coves





LST trends of persistent (left) and new (right) urban





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Summary

- Remote sensing derived LCMAP and NLCD products have been used to map and monitor national annual land cover and land use change
- The LCMAP products provide annual land change products that filled observational gaps for the national land change. The products have been used in NCA5
- The land change information has been used to assess the spatial distributions and longterm trends of different land cover/use change and associated climate impacts, e.g., land cover transition, urban heat island, national tree regrowth time

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Thanks!